

Analysing the spatial distribution of vulnerability to floods in the Salzach catchment, Austria

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Project Context & Case Study

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FP6 Project: **BRAHMATWINN** - Twinning European and South Asian River Basins to enhance capacity and implement adaptive management approaches



Case study: Salzach catchment
 (Tributary Inn/Danube; 6649 km²)

>> Prone to floods (rectified river Course; last major events 2002)

>> High mountain areas (Permafrost)

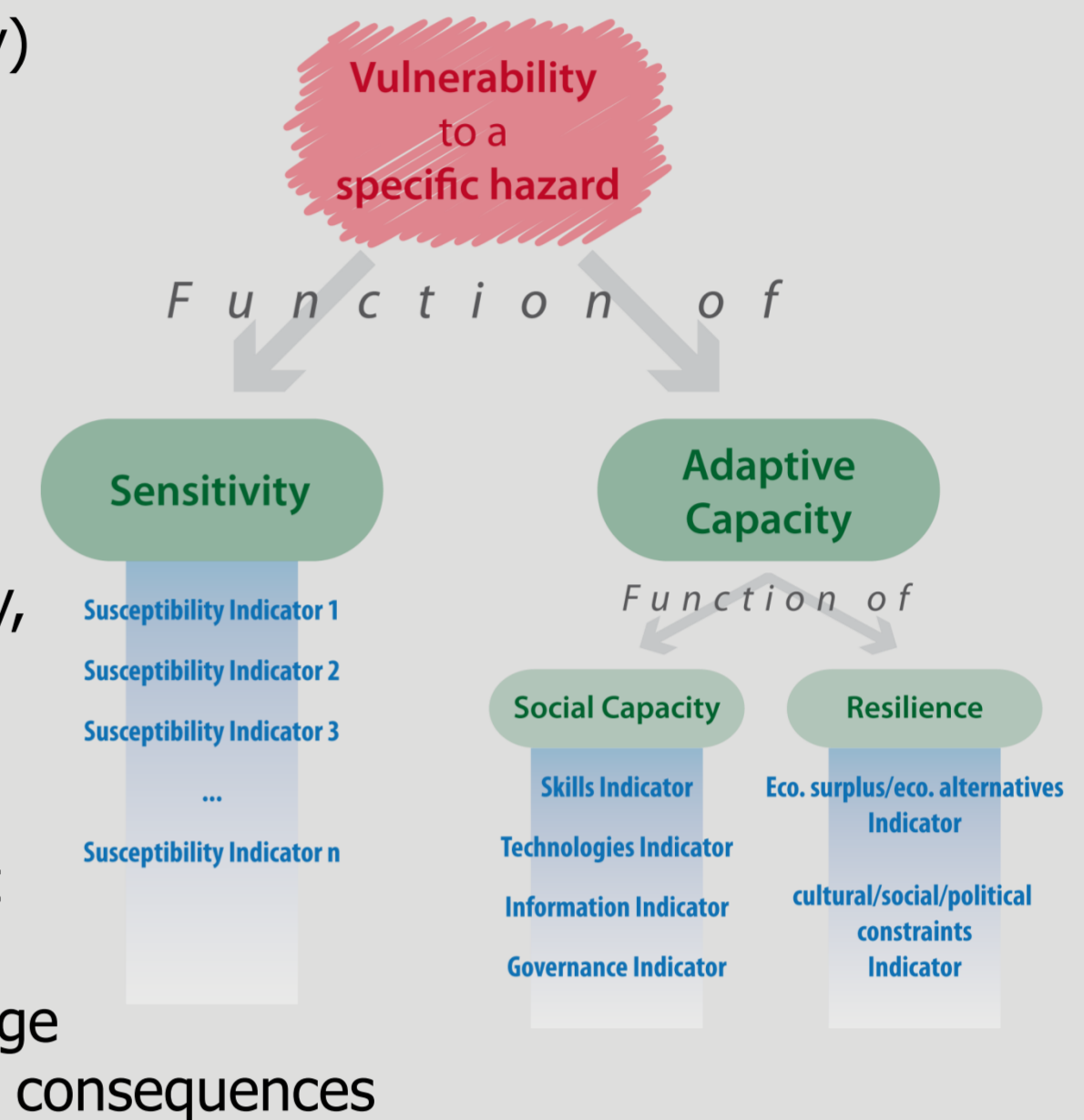
>> Settlements along valley floors and major urban area around Salzburg (total 454 000 inhabitants)

Vulnerability concept

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Risk =
 $f(\text{Hazard, Socio-eco. Vulnerability})$

Hazard =
 $f(\text{Exposure, Magnitude})$



>> **Sensitivity**
 Degree to which a system is affected, adversely or beneficially, by climate-related stimuli.

>> **Adaptive Capacity**
 The ability of a system to adjust to climate change, moderate potential damages, take advantage of opportunities or cope with the consequences

Methodology

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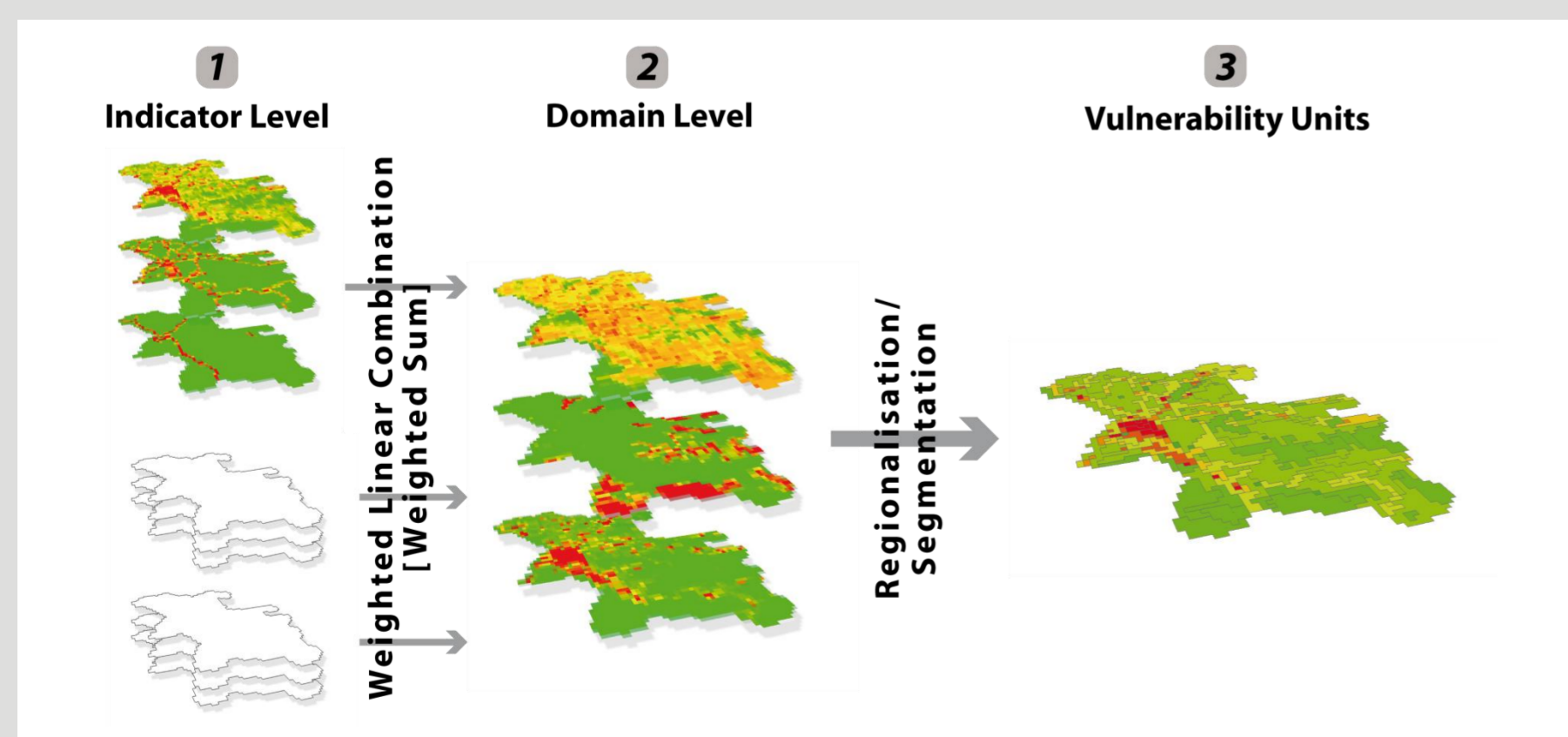
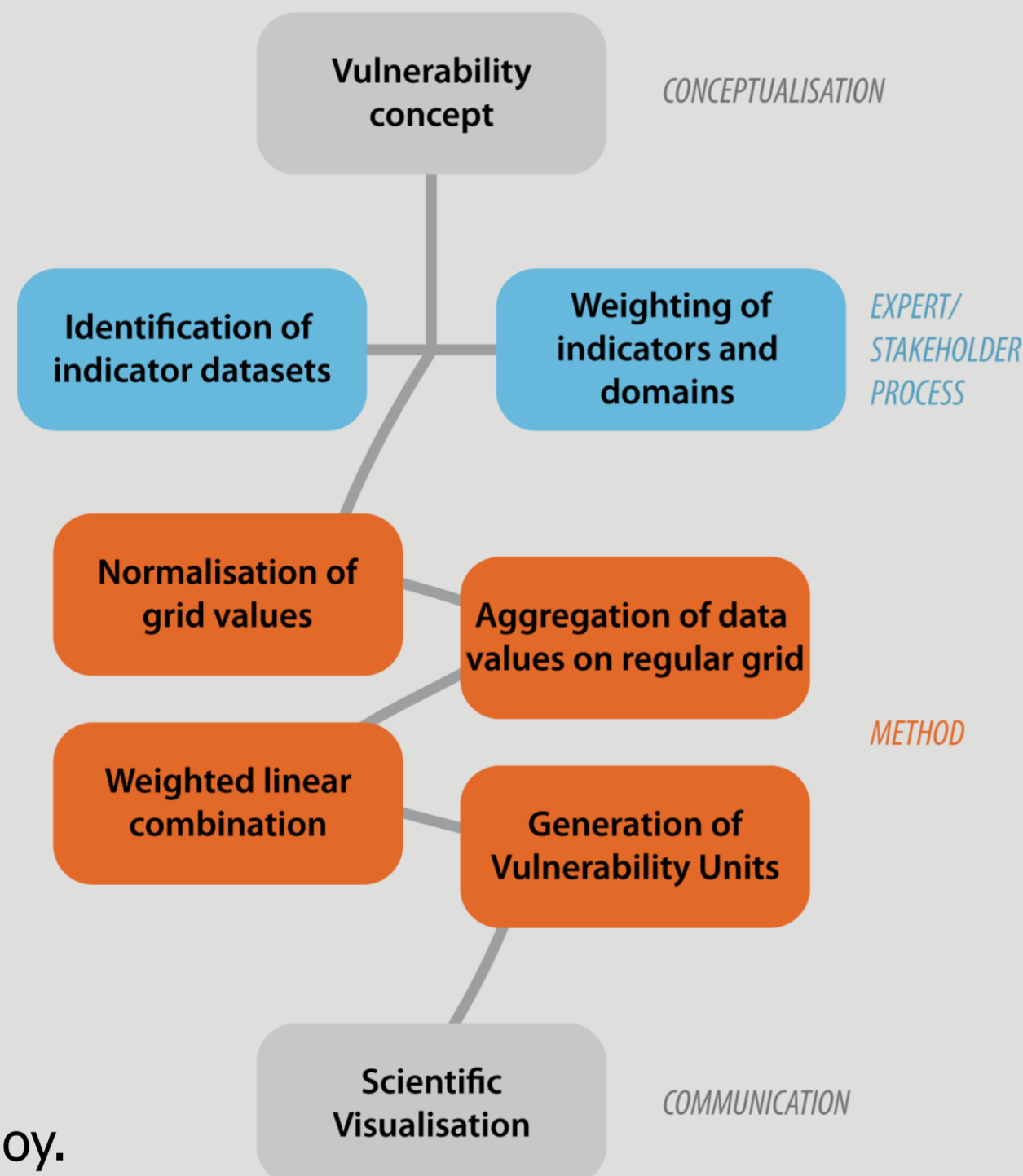
Aim

>> Units of a common characteristic of Vulnerability → Vulnerability Units (VulnUs)

>> Independent from administrative units

>> Integration of stakeholder perceptions and weights

>> Domains: Housing, Infrastructure, Assets, Land Use/Land Cover, Age, Means of subsistence, Employ. per econom. sector, workplace, Access, Early Warning, Origin, Education

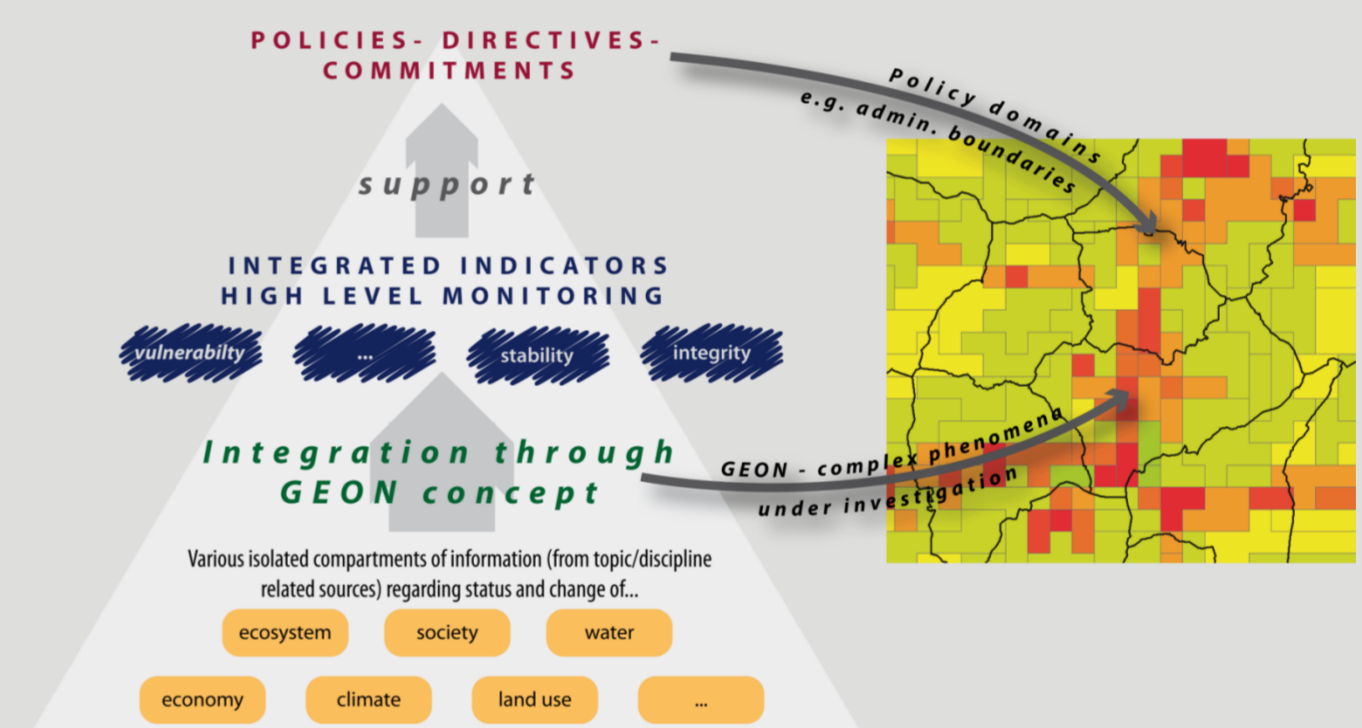


Data integration through

- >> Multi Criteria Evaluation approaches
- >> Regionalisation /Segmentation
- >> Application of expert weights

Geon concept

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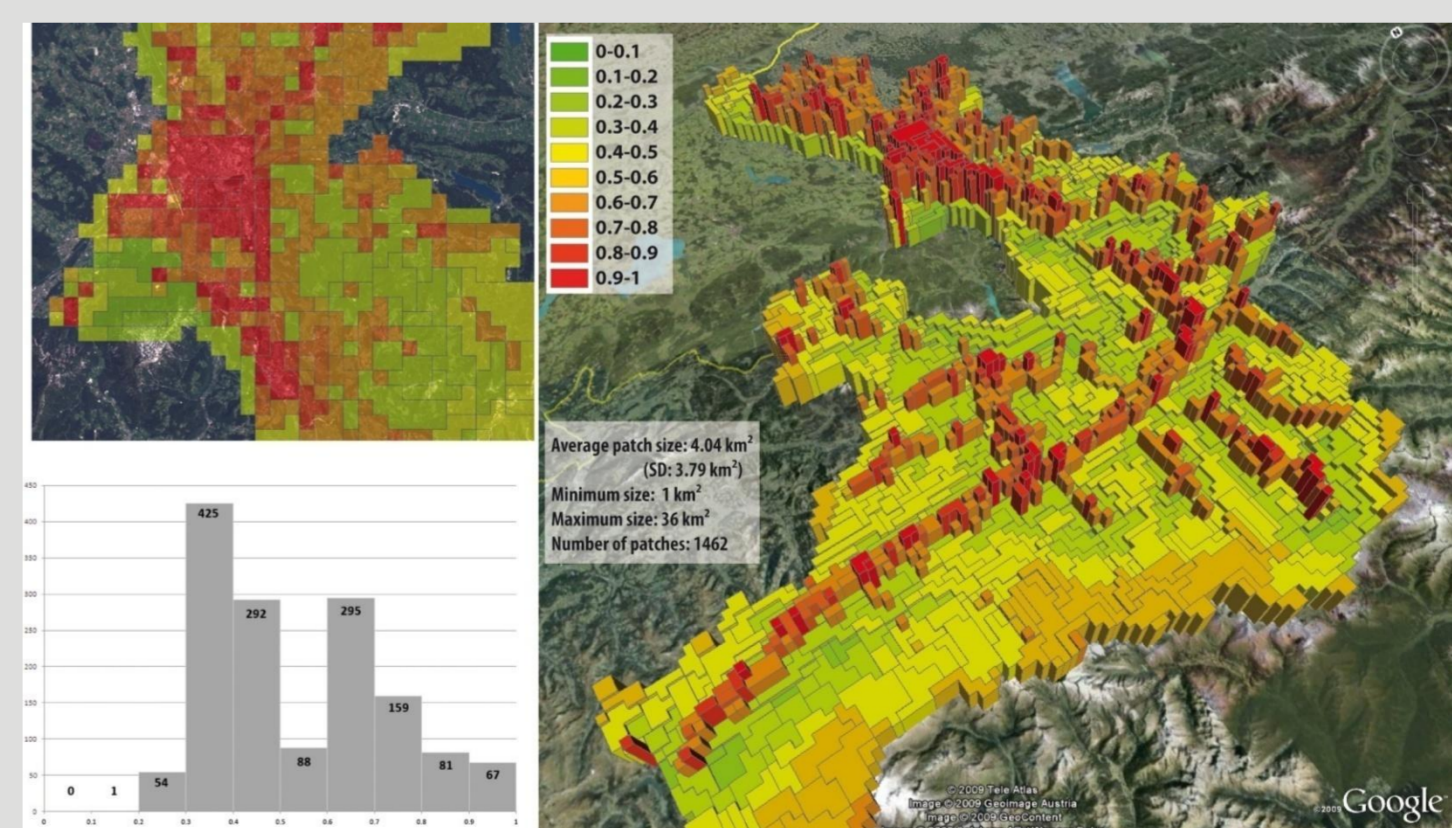
Geon (from Greek gé = Earth and on = part, unit): system-theory driven, scale-dependent and hierarchical 'earth-object'

>> Spatial objects, homogenous in terms of varying spatial phenomena under the influence of policy intervention.

>> The key issue is a scale-specific spatial regionalization of a complex, usually multidimensional spatial reality

Results

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Socio-economic Vulnerability Units

>> **Policy-relevance:** opportunity to visualize vulnerability for stakeholders and to facilitate the exploration of intervention options with them.

>> **Monitoring:** Identification of changes within time and domains → basis for intervention

>> **Challenge:** Validation of vulnerability in reality

In-depth description of the approach is available in (Figures are taken from):
 Kienberger, S., Lang, S., and Zeil, P. (2009). Spatial vulnerability units – expert-based spatial modelling of socio-economic vulnerability in the Salzach catchment, Austria, *Nat. Hazards Earth Syst. Sci.*, 9, 767-778 (Open Access Journal)